

V.3.3-API-CONT CONTINUOUS INCREMENTAL API OPERATION

Identifier: API-CONT

Application: All programs

Description: This Operation generates runoff from rain or rain plus melt data on a continuous basis.

An Antecedent Precipitation Index (API) is used as an indicator of soil-moisture conditions. All surface runoff calculations are done on a time interval or incremental basis rather than on a storm basis as is the case with many API models. In addition to surface runoff the Operation also generates baseflow runoff for each time period. An option is included to account for the effect of frozen ground on runoff computations.

A description of this Operation is in Chapter II.3-API-CONT.

Allowable Time Intervals: 1, 2, 3, 4, 6, 8, 12 and 24 hours

Time Series Used: Time series used in this Operation are as follows:

<u>General Type</u>	<u>Dimn</u>	<u>Units</u>	<u>Use</u>	<u>Required</u>	<u>Form of Output T.S.</u>	<u>Data Time Interval</u>	<u>Missing Values Allowed</u>
Precipitation	L	MM	I	yes	n/a	any	no
Total runoff	L	MM	O	no	replaces	any <u>1/</u>	no
Potential evaporation	L	MM	I	yes <u>2/</u>	n/a	24	no
Air temperature	TEMP	DEGC	I	yes <u>2/</u>	n/a	any <u>3/</u>	no
Areal snow cover	DLES	PCTD	I	no	n/a	any <u>3/</u>	no
Water-equivalent	L	MM	I	no	n/a	any <u>3/</u>	no
Storm runoff	L	MM	O	no	replaces	any <u>1/</u>	no
Groundwater runoff or discharge	L/T or L3/T	MM or CMS	O	no	replaces	any <u>1/</u>	no
Antecedent index	L	MM	O	no	replaces	any <u>3/</u>	no
API	L	MM	O	no	replaces	any <u>3/</u>	no
Frost index	TEMP	DEGC	O	no	replaces	any <u>3/</u>	no

<u>General Type</u>	<u>Dimn</u>	<u>Units</u>	<u>Use</u>	<u>Required</u>	<u>Form of Output T.S.</u>	<u>Data Time Interval</u>	<u>Missing Values Allowed</u>
API contents <u>4/</u>	L	MM	0	no	replaces	any <u>3/</u>	no
AEI	L	MM	0	no	replaces	any <u>3/</u>	no
ATI	TEMP	DEGC	0	no	replaces	any <u>3/</u>	no
Percent surface runoff	DLES	PCTD	0	no	replaces	any <u>1/</u>	no
Frost efficiency index	DLES	PCTD	0	no	replaces	any <u>3</u>	no

Notes:

- 1/ Must be the same as the data time interval for precipitation.
- 2/ Required only if AEI, ATI or frozen ground options used.
- 3/ Must be an even multiple of the data time interval for precipitation.
- 4/ Data type code is 'APIC'.

Input Summary: The card input for this Operation is as follows:

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
1	5A4	1-20	Description of area or runoff zone
	3X,I2	24-25	Data time interval for precipitation and total runoff time series
	7X,2A4	33-40	Identifier for the precipitation or rain+melt time series
	1X,A4	42-45	Data type code for precipitation or rain+melt
	7X,2A4	53-60	Identifier for the total runoff time series (leave blank if total runoff is not needed)
	1X,A4	62-65	Data type code for total runoff time series (leave blank if not needed)
	F7.0	66-72	Drainage area for the area or runoff zone (units of MI <sup>2</sup> ) - only needed if a groundwater runoff time series is generated in discharge units

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
2	2X,A3	3-5	First quadrant variation option: 'WKN' = use week of year 'AEI' = use Antecedent Evaporation Index 'ATI' = use Antecedent Temperature Index
	1X,A4	7-10	Enter 'FRZE' to use the frozen ground option (blank otherwise)

The following 11 fields control optional input and output time series. Enter data type code if the time series is to be used in this Operation or is to be generated for use in another Operation. Leave blank if the time series is not to be used or generated.

1X,A4	12-15	Areal extent of snow cover
1X,A4	17-20	Snow water-equivalent
1X,A4	22-25	Storm runoff (surface plus impervious area runoff)
1X,A4	27-30	Groundwater runoff (baseflow minus riparian vegetation loss) - can be in length or discharge units - data type code determines the output units
1X,A4	32-35	Antecedent Index (AI)
1X,A4	37-40	API
1X,A4	42-45	Frost index (columns 7-10 must be 'FRZE')
1X,A4	47-50	API contents (data type must be 'APIC')
1X,A4	52-55	AEI (columns 3-5 must be 'AEI') or ATI (columns 3-5 must be 'ATI')
1X,A4	57-60	Percent surface runoff (i.e. surface runoff-precipitation ratio expressed as a decimal fraction)
1X,A4	62-65	Frost Efficiency Index (columns 7-10 must be 'FRZE')
1X,A4	67-70	Enter 'PROT' to print detailed output for each time interval (blank otherwise). This option is used when running Calibration System program (MCP3 or OPT3) and the months to print are controlled by card 11. If running the Operational Forecast System program FCST

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
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then use the Technique PRINTSMA to set this option. The output consists of the state variables and other computed quantities for each computational time interval.

1X,I1	72	Control to store water balance sums: 0 = do not store sums 1 = store sums
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Card 3 only needed if Card 2 columns 3-5 are equal to 'AEI' or 'ATI' or Card 2 columns 7-10 are equal to 'FRZE'.

3	2X,2A4	3-10	Identifier for the Potential Evaporation (PE) time series (blank if none used)
	1X,A4	12-15	PE data type code
	F5.2	16-20	PEADJ - Potential evaporation adjustment factor
	2X,2A4	23-30	Identifier for the air temperature time series (blank if none used)
	1X,A4	32-35	Data type code air temperature time series
	3X,I2	39-40	Data time interval for air temperature time series (must be a multiple of the precipitation/runoff data time interval)
	5X,F5.0	46-50	Elevation difference (units of FT) between the area being modeled and the temperature time series - positive indicates that the area is higher than the elevation represented by the temperature time series

Lapse rates are only needed if the elevation difference is non-zero.

F5.1	51-55	Lapse rate (units of DEGF/1000 FT) at time of maximum temperature - assumed to occur at 3 PM Local Standard Time
F5.1	56-60	Lapse rate (units of DEGF/1000 FT) at time of minimum temperature - assumed to occur at 6 AM Local Standard Time

Card 4 is for optional input time series - only needed if areal extent of snow cover or water-equivalent data are available.

4	2X,2A4	3-10	Identifier for the areal extent of snow cover time series (blank if none)
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<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
			available)
	3X,I2	14-15	Data time interval for areal extent of snow cover data (must be a multiple of the precipitation/runoff data time interval)
	2X,2A4	18-25	Identifier for the water-equivalent time series (blank if none available)
	3X,I2	29-30	Data time interval for water-equivalent data (must be a multiple of the precipitation/runoff data time interval)

Card 5 is for optional output time series - only needed if storm runoff, groundwater runoff or discharge, AI, API or frost index time series are to be generated.

5	2X,2A4	3-10	Identifier for the storm runoff time series
	2X,2A4	13-20	Identifier for the groundwater runoff or discharge time series
	2X,2A4	23-30	Identifier for the AI time series
	3X,I2	34-35	Data time interval for the AI time series (must be a multiple of the precipitation/runoff data time interval)
	2X,2A4	38-45	Identifier for the API time series
	3X,I2	49-50	Data time interval for the API time series (must be a multiple of the precipitation/runoff data time interval)
	2X,2A4	53-60	Identifier for the frost index time series
	3X,I2	64-65	Data time interval for the frost index time series (must be a multiple of the precipitation/runoff data time interval)

Card 5A is for additional optional output time series - only needed if API contents, AEI, ATI, percent surface runoff or frost efficiency index (FEI) time series are to be generated.

5A	2X,2A4	3-10	Identifier for the API contents time series
	3X,I2	14-15	Data time interval for the API contents time series (must be a multiple of the precipitation/runoff data time interval)

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
	2X,2A4	18-25	Identifier for the AEI or ATI time series
	3X,I2	29-30	Data time interval for the AEI or ATI time series (must be a multiple of the precipitation/runoff data time interval)
	2X,2A4	33-40	Identifier for the percent surface runoff time series
	7X,2A4	48-55	Identifier for the frost efficiency index time series
	3X,I2	59-60	Data time interval for frost efficiency index time series (must be a multiple of the precipitation/runoff data time interval)

Card 6 contains the major surface runoff parameters and Card 6A the minor surface runoff parameters.

6	F5.2	1-5	PXADJ - Precipitation adjustment factor
	F5.2	6-10	AIXW - AI maximum for wet conditions (units of IN, .GT.0)
	F5.2	11-15	AIXD - AI maximum for dry conditions (units of IN, .GT.AIXW)
	F5.2	16-20	CW - curvature constant for wet conditions (.GT.0, .LT.1)
	F5.2	21-25	CD - curvature constant for dry conditions (.GT.0, .LT.1)
	F5.2	26-30	SMIX - maximum SMI value (units of IN)
	F5.2	31-35	CS - exponent used to control the shape of the 1st quadrant variation from dry to wet conditions when using week number (.GT.0). CS is not used when the 1st quadrant variation option is AEI or ATI.
	F5.2	36-40	FRSX - fraction of precipitation that becomes surface runoff when AI = 0.0 (decimal fraction, .GT.0, .LE.1.0)
6A	F5.2	1-5	PIMPV - impervious area (decimal fraction, .GE.0, .LT.1)
	F5.2	6-10	APIK - daily API recession factor (.GT.0, .LT.1)
	F5.2	11-15	PEX - daily maximum SMI reduction rate

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
			for July 15 (units of IN). If 1st quadrant option = 'AEI' then PE vegetation adjustment factor for July 15 (see note below).
	F5.2	16-20	PEN - minimum SMI reduction rate for January 15 (units of IN). If 1st quadrant option = 'AEI' then PE vegetation adjustment factor for January 15 (see note below).
	F5.2	21-25	EFC - effective forest cover (decimal fraction, .GE.0, .LE.1)
	F5.2	26-30	RIVA - riparian vegetation area (decimal fraction, .GE.0, .LE.1)
	F5.2	31-35	RVAI - AI value above which riparian evaporation occurs (units of IN)
	F5.2	36-40	APIX - maximum allowed API value (units of IN) - default is 10.0 IN
	F5.2	41-45	APIKS - daily API recession factor when a complete snow cover exists (.GE.APIK, .LE.1). Only needed if areal extent of snow cover or water-equivalent data are used.

When using the 'AEI' option the seasonal PE vegetation adjustment factor is only applied to 2nd quadrant (i.e. SMI) computations. The seasonal adjustment factor is not applied to the computations of AEI for use in the 1st quadrant.

Card 7 contains the first quadrant variation parameters that determine wet and dry conditions. Table 1 lists the dates associated with each even week number.

If Card 2 columns 3-5 = 'WKN' then Card 7 contains:

7	F5.0	1-5	WKW - week number for wet conditions (.GT.0, .LE.52)
	F5.0	6-10	WKD - week number for dry conditions (.GT.0, .LE.52, .NE.WKW)

Table 1 lists the dates associated with each even week number.

If Card 2 columns 3-5 = <AEI< then Card 7 contains:

7	F5.2	1-5	AEIX - maximum AEI value, dry conditions (units of IN)
	F5.2	6-10	AEIN - minimum AEI value, wet conditions

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
			(units of IN)
	F5.2	11-15	AEIK - AEI recession factor (.GT.0, .LT.1)
If Card 2 columns 3-5 = <ATI< then Card 7 contains:			
7	F5.0	1-5	ATIX - maximum ATI value, dry conditions (units of DEGF)
	F5.0	6-10	ATIN - minimum ATI value, wet conditions (units of DEGF)
	F5.2	11-15	ATIR - ATI rate constant (.GT.0, .LT.1)
Card 8 contains groundwater runoff parameters.			
8	F5.3	1-5	BFPK - primary baseflow recession factor (.GT.0, .LT.1)
	F5.2	6-10	BFIK - baseflow inflow index recession factor (same as supplemental baseflow recession factor) (.GT.0, .LT.1)
	F5.2	11-15	BFIM - baseflow inflow index multiplier (.GE.0.0)
	F5.2	16-20	AICR - critical AI value for baseflow recharge (units of IN)
	F5.2	21-25	CG - curvature constant for determining recharge when AI .GT.AICR (.GT.0, .LT.1)
Card 9 contains frozen ground parameters. Only use Card 9 if Card 2 columns 7-10 equals 'FRZE'.			
9	F5.2	1-5	CSOIL - bare ground frost coefficient (6 hour <sup>-1</sup> )
	F5.2	6-10	CSNOW - frost coefficient reduction factor for snow (decimal fraction, .GT.0, .LT.1)
	F5.2	11-15	GHC - daily thaw rate from ground heat (units of DEGF, .GE.0)
	F5.1	16-20	FICR - critical frost index value (units of DEGF, .LE.32)
	F5.3	21-25	CF - FEI freezing coefficient (units of DEGF <sup>-1</sup> , .GE.0)
	F5.2	26-30	CP - FEI precipitation coefficient (units of IN) (amount of precipitation

<u>Card</u>	<u>Format</u>	<u>Columns</u>	<u>Contents</u>
			required to fill soil pores with ice)
	F5.4	31-35	CT - FEI thaw coefficient (DEGF <sup>-1</sup> ·6 hr <sup>-1</sup> , .GE.0)
	F5.2	36-40	EFA - effective frost area (decimal fraction, .GT.0, .LE.1)

Card 10 contains initial carryover values.

10	F5.2	1-5	API - Antecedent Precipitation Index (units of IN, .GE.0, .LE.APIX)
	F5.2	6-10	SMI - Surface Moisture Index (units of IN, .GE.0, .LE.SMIX)
	F5.2	11-15	BFSC - baseflow storage contents (units of IN)
	F5.2	16-20	BFI - baseflow inflow index (units of IN, .GE.0)
	F5.1	21-25	Based on value of Card 2 columns 3-5 (not used if 'WKN'): o if 'AEI' then AEI (units of IN, .GE.AEIN, .LE.AEIX) o if 'ATI' then ATI (units of DEGF, .GE.ATIN, .LE.ATIX)
	F5.1	26-30	FI - Frost Index (units of DEGF, .LE.32) - only needed if Card 2 columns 7-10 = 'FRZE'
	F5.2	31-35	FEI - Frost efficiency index (.GE.0, .LE.1) - only needed if Card 2 columns 7-10 = 'FRZE'

Card 11 is only needed if Card 2 columns 67-70 equals 'PROT' and this is a Calibration System program (MCP3 or OPT3).

11 The first four fields specify the first period for which detailed output is to be printed:

3X,I2	4-5	Beginning month
1X,I4	7-10	Beginning year (4 digits)
3X,I2	14-15	Ending month
1X,I4	17-20	Ending year (4 digits)
	24-40	Same information for second period of detail output (same format - leave blank if not used)

Sample Input and Output: Sample input is shown in Figure 1. Sample output from the parameter print and print carryover routines is shown in Figure 2. Sample output from the execution routine is shown in Figure 3.

Error and Warning Messages: The error and warning messages generated by this Operation and the corrective action to take when they occur is as follows:

A. Messages that can occur during setup.

1. **\*\*ERROR\*\*** THE FIRST QUADRANT OPTION = XXX, IT SHOULD BE WKN, AEI or ATI.

Action: Specify correct input for columns 3-5 on card 2.

2. **\*\*ERROR\*\*** THE TIME INTERVAL (XX HOURS) FOR TYPE XXXX IS NOT A MULTIPLE OF THE TIME INTERVAL (YY HOURS) FOR TYPE YYYY.

Action: Use a valid data time interval.

3. **\*\*ERROR\*\*** ONE OR MORE OF THE PARAMETER VALUES FOR THE API-CONT OPERATION EXCEED THEIR ALLOWABLE LIMITS.

Action: Check all parameter values, correct those in error and resubmit.

4. **\*\*ERROR\*\*** ONE OR MORE OF THE CARRYOVER VALUES FOR THE API-CONT OPERATION EXCEED THEIR ALLOWABLE LIMITS.

Action: Check all carryover values, correct those in error and resubmit.

5. **\*\*WARNING\*\*** AT LEAST ONE OF THE LAPSE RATES ARE NOT POSITIVE. CHECK THAT VALUES ARE CORRECT.

Action: Temperature normally decreases with elevation (positive lapse rate), though in a few areas inversion conditions predominate, especially for minimum temperatures, during some seasons of the year.

B. Messages that can occur during execution.

None.

Carryover Transfer Rules: The following rules apply to the state variables for this Operation during the carryover transfer process.

1. API - value is retained as long as it doesn't exceed the new value of APIX. In that case, API = APIX.

2. SMI - deficit (i.e., SMIX-SMI) is retained as long as the contents do not go below zero
3. BFSC - baseflow storage contents are adjusted so that the amount of baseflow remains the same. The equation used is:

$$BFSC_n = BFSC_o * \frac{(1 - BFPK_o) * (1 + BFIM_o * BFIO)}{(1 - BFPK_n) * (1 + BFIM_n * BFIO)}$$

where subscript n indicates new values  
subscript o indicates old values

4. BFI - value is not changed.
5. AEI or ATI - value is retained as long as it is within the new user specified limits. If the value falls outside the limits, it is set to the closest limit. No carryover transfer occurs when changing the first quadrant option to AEI or ATI from one of the other options. The user input carryover value is used in this case.
6. FI - value is not changed. When changing from frozen ground 'off' to frozen ground 'on' the user input value of FI is used.
7. FEI - value is not changed. When changing from frozen ground 'off' to frozen ground 'on' the user input value of FEI is used.

Punched Card Limitations: The punched card formats for this Operation are as follows. No checks are made to determine if quantities exceed the maximum value.

<u>Parameter or Variable</u>	<u>Punch Format</u>	<u>Maximum Value</u>	<u>Precision After Decimal Point</u>
ATIX, ATIN, FICR, APIX, ATI, FI, Lapse rates	F5.1	999.9	tenths
AIXD, AIXW, SMIX, AEIX, AEIN, BFIM, API, SMI, CS, BFSC, BFI, AEI, AICR, RVAI, PEADJ, PXADJ, APIK, GHC, CP, APIKS	F5.2	99.99	hundredths
WKW, WKD	F5.0	52.0	none
FRSX, EFC, RIVA, ATIR, CG, CSNOW, EFA, FEI	F5.2	1.0	hundredths
CW, CD, PIMPV, AEIK, BFIK, CF	F5.3	0.999	thousandths

<u>Parameter or Variable</u>	<u>Punch Format</u>	<u>Maximum Value</u>	<u>Precision After Decimal Point</u>
Elevation difference	F5.0	99999.	none
BFPK, CT	F5.4	.9999	ten thousandths
PEX, PEN, CSOIL	F5.3	9.999	thousandths
Drainage area	F7.1	99999.9	tenths

Table 1. Dates associated with each even week number

<u>Week</u>	<u>Date</u>	<u>Week</u>	<u>Date</u>
1	01/07	27	07/08
2	01/14	28	07/15
3	01/21	29	07/22
4	01/28	30	07/31
5	02/04	31	08/05
6	02/11	32	08/12
7	02/18	33	08/19
8	02/25	34	08/26
9	03/04	35	09/02
10	03/11	36	09/09
11	03/18	37	09/16
12	03/25	38	09/23
13	04/01	39	09/30
14	04/08	40	10/07
15	04/15	41	10/14
16	04/22	42	10/21
17	04/29	43	10/28
18	05/06	44	11/04
19	05/13	45	11/11
20	05/20	46	11/18
21	05/27	47	11/25
22	06/03	48	12/02
23	06/10	49	12/09
24	06/17	50	12/16
25	06/24	51	12/23
26	07/01	52	12/30

Figure 1. Sample input for Operation API-CONT

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                                - Column -
      5    10    15    20    25    30    35    40    45    50    55    60    65    70    75    80
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
API-CONT      DARNC
PECATONICA-DARNC      6      DARNC      RAIM      DARNC      INFW
WKN FRZE SASC SWE  SURO GWRO      MAT      6      FGIX      PSRO FEIX
DARNC      6 DARNC      6      0.0
DARNC      DARNC      DARNC      DARNC      24
1.0  8.0  15.  .70  .70  1.0  2.0  .50      DARNC      DARNC      24
.005 0.9  .20  0.0  0.0  0.0  0.0  8.  1.0
  10  36
.994 .80  3.0  3.21  .61
.10  .88  .20  27.  .02  0.8.0025  1.0
1.0  1.0  1.6  0.0      -40.0  0.1

```

Figure 2. Sample output from Operation API-CONT print parameter and print carryover routines

CONTINUOUS API OPERATION FOR PECATONICA-DARNC

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      TIME SERIES USED BY THIS OPERATION
      CONTENTS          I.D.      TYPE      TIME INTERVAL
RAIN+MELT/PRECIP      DARNC      RAIM      6 HOURS      PXADJ= 1.00
TOTAL RUNOFF          DARNC      INFW      6 HOURS
AREAL EXTENT OF SNOW  DARNC      SASC      6 HOURS
SNOW WATER-EQUIVALENT  DARNC      SWE       6 HOURS
AIR TEMPERATURE       DARNC      MAT       6 HOURS
STORM RUNOFF          DARNC      SURO      6 HOURS
GROUNDWATER RUNOFF    DARNC      GWRO      6 HOURS
FROST INDEX           DARNC      FGIX      24 HOURS
FROST EFFICIENCY INDEX  DARNC      FEIX      24 HOURS
FRACTION SURFACE RUNOFF  DARNC      PSRO      6 HOURS

PARAMETER VALUES - ENGLISH UNITS

SURFACE-MAJOR          AIXW  AIXD  CW  CD  CS  SMIX  FRX  AIADJ
                      8.00  15.00 .700 .700 2.00 1.00 .50 .00

SURFACE-MINOR          PIMPV  APIK  PEX  PEN  EFC  RIVA  RVAI  APIX  APIKS
                      .005   .90   .20  .00  .00  .00  .00  8.00  1.00

VARIATION-1ST QUAD    WKW  WKD
                      10.0  36.0

BASEFLOW              BFPK  BFIK  BFIM  AICR  CG
                      .9940 .800  3.00  3.21 .61

FROZEN GROUND         CSOIL  CSNOW  GHC  FICR  CF  CP  CT  EFA
                      .10   .88   .20  27.0 .020 .80 .0025 1.00

CARRYOVER             API  SMI  BFSC  BFI  FI  FEI  ENGLISH UNITS
                      1.00 1.00 1.60 .00 -40.0 .10

```

Figure 3. Sample output from Operation API-CONT execution routine

DETAILED API-CONT OUTPUT FOR PECATONICA-DARNC										3/1993		TIME ZONE=MST		UNITS ARE IN.				
DAY-HR	PRECIP	SUR-RO	API	WK	Y	AI	SMI	AIF	FS	FG	GI	GS	BFI	GW-RO	TOT-RO	FI	FEI	
29 11	.00	.00	1.00	12.6	.02	5.72	1.00	5.72	.07	.00	.00	1.60	.00	.002	.00	-40.0	.10	
29 17	.00	.00	1.00	12.6	.02	5.72	1.00	5.72	.07	.00	.00	1.60	.00	.002	.00	-39.9	.10	
29 23	.00	.00	1.00	12.6	.02	5.72	1.00	5.72	.07	.00	.00	1.59	.00	.002	.00	-39.9	.10	
30 5	.00	.00	1.00	12.6	.02	5.72	1.00	5.72	.07	.00	.00	1.59	.00	.002	.00	-39.8	.10	
30 11	.00	.00	1.00	12.7	.03	5.73	1.00	5.73	.07	.00	.00	1.59	.00	.002	.00	-39.8	.10	
30 17	.00	.00	1.00	12.7	.03	5.73	1.00	5.73	.07	.00	.00	1.59	.00	.002	.00	-39.7	.10	
30 23	.00	.00	1.00	12.7	.03	5.73	1.00	5.73	.07	.00	.00	1.58	.00	.002	.00	-39.7	.10	
31 5	.00	.00	1.00	12.7	.03	5.73	1.00	5.73	.07	.00	.00	1.58	.00	.002	.00	-39.6	.10	
31 11	.00	.00	1.00	12.9	.03	5.74	1.00	5.74	.07	.00	.00	1.58	.00	.002	.00	-39.6	.10	
31 17	.00	.00	1.00	12.9	.03	5.74	1.00	5.74	.07	.00	.00	1.58	.00	.002	.00	-39.5	.10	
31 23	.00	.00	1.00	12.9	.03	5.74	1.00	5.74	.07	.00	.00	1.57	.00	.002	.00	-39.5	.10	
1 5	.00	.00	1.00	12.9	.03	5.74	1.00	5.74	.07	.00	.00	1.57	.00	.002	.00	-39.4	.10	
1 11	.00	.00	1.00	13.0	.03	5.76	1.00	5.76	.07	.00	.00	1.57	.00	.002	.00	-39.4	.10	
1 17	.01	.00	1.01	13.0	.03	5.76	1.00	5.76	.07	.28	.00	1.57	.00	.002	.00	-39.3	.10	
1 23	.52	.05	1.40	13.0	.03	5.20	1.00	5.20	.13	.33	.15	1.72	.15	.003	.06	-39.2	.32	
2 5	1.54	.85	1.78	13.0	.03	4.37	1.00	4.37	1.00	.49	.33	2.05	.47	.006	.86	-39.2	1.00	